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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/761,820	01/21/2004	Sudhir S. Malhotra	K2003010	4071

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EXAMINER
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RICKMAN, HOLLY C

ART UNIT	PAPER NUMBER
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1773

DATE MAILED: 06/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/761,820	MALHOTRA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Holly Rickman	1773	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 March 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The rejection of claims 3, 13, and 20 under 35 U.S.C. 112, second paragraph, is withdrawn in view of Applicant's arguments. The phrase "underlayers substantially lack boron" has been interpreted to mean that the underlayers are either free from boron or contain boron in a small amount. This "small amount" is exemplified in the specification as being less than 1 at% (see paragraph [0036]).

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 25-29, 31-32, and 34-35 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The originally filed disclosure fails to provide adequate support for the newly added limitations directed to an underlayer that is "sufficiently free of boron such that said third bcc underlayer causes said medium to exhibit reduced noise." There is no description describing what amount of boron constitutes "sufficiently free" in order to cause the medium to exhibit reduced noise.

The originally filed disclosure fails to provide written description for the newly added limitations “substantially free of boron” and “free of boron”. Without written description, it is not clear whether the scope of these terms is the same as “lacking” or “substantially lacking” which are the terms used in the specification. Because the claims already include limitations directed to underlayers which “substantially lack boron”, it appears that Applicant is making some distinction between the scope of “substantially free of boron” and “substantially lacking boron.” For the sake of clarity, the examiner suggests that Applicant substitute the phrases “lacking” or “substantially lacking” for “free” and “substantially free of”.

***Claim Rejections - 35 USC § 102***

4. The rejection of claims 12, 14, 16-19, and 22-24 under 35 U.S.C. 102(e) as being anticipated by Kanbe et al. (US 6830837) is withdrawn in view of Applicant’s arguments.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-25, 27, and 29-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wong (US 6645551) in view of Kanbe et al. (US 6830837).

Wong discloses a magnetic recording medium having a NiP-plated substrate, Cr-based, bcc underlayers and a magnetic recording layer. The disclosure of using more than two underlayers (col. 3, lines 31-32) would have suggested to one of ordinary skill in the art at the time of invention that 3, 4, or more underlayers would be within the scope of the invention. As such, the examiner takes the position that any underlayers in addition to the three described above would meet the limitation set forth in claims 8, 15, and 21 directed to a nucleation layer between the magnetic layer and the third underlayer. The reference suggests the use of three (i.e., two *or more* – col. 3, line 31-32) Cr-based bcc underlayers wherein each layer is formed from one of Cr, CrX or CrXY and X and Y are chosen from a group of alloying elements. The reference discloses examples of suitable alloying elements but fails to disclose the use of B in at least the second underlayer. The reference is also silent with regard to the use of antiferromagnetically coupled magnetic layers.

Kanbe et al. teaches that it is known in the art to add B in small amounts to bcc Cr alloy underlayer deposited on top of a Cr layer not containing B (col. 6, lines 48-59) in order to reduce medium noise. It would have been obvious to one of ordinary skill in the art at the time of invention to add B to the second, third and additional Cr alloy underlayers taught by Wong in order to reduce medium noise.

With respect to claims 3-4 and 13, Kanbe et al. teach that B is desirably added in an amount of 15 at% or less to an underlayer or underlayers deposited on a first Cr underlayer not containing B (i.e. 0 at% B). Because the addition of B affects the grain size of the overlying magnetic layer, it would have been obvious to one of ordinary skill in the art at the time of invention to add an optimal amount of B to the second, third and any additional underlayers

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taught by Wong et al. to achieve optimal magnetic recording grain size. It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Thus, the examiner contends that the claims directed to the presence of less than 1 at% B in the first and third underlayer do not present a patentable distinction over the applied prior art in the absence of evidence of unexpected results associated with this specific range. The examiner maintains that the amount of B suggested by the prior art meets the limitations of claims 25, 27, and 29-34.

With respect to claims 10, 17, and 23, Kanbe et al. teaches that substituting antiferromagnetically coupled magnetic layers for a single magnetic layer increases thermal stability of the medium (col. 3, lines 29-52). It would have been obvious to one of ordinary skill in the art at the time of invention to substitute antiferromagnetically coupled magnetic layers for the single magnetic layer taught by Wong in order to improve the thermal stability of the medium.

#### ***Allowable Subject Matter***

7. Claims 26 and 28 contain subject matter which would be allowable if amended to overcome the rejection under 35 USC 112, first paragraph. The examiner suggests that Applicant consider amending the claims to require a third bcc underlayer that lacks boron. The specification clearly supports this language and the prior art fails to teach or suggests a recording medium having first, second and third bcc underlayers wherein the second underlayer contains B and the third underlayer contains no B (i.e., lacks boron).

*Response to Arguments*

8. Applicant's arguments, including the declaration, filed 3/6/06 have been fully considered but they are not persuasive.

Applicant argues that claims 1-24 distinguish over the combination of Wong in view of Kanbe. Applicant maintains that Kanbe only teaches the addition of boron to the uppermost Cr bcc underlayer.

The examiner respectfully disagrees. Kanbe teaches that the Cr underlayer that is in contact with the substrate should be free from B and that the underlayer deposited thereon contains B in order to reduce the grain size of this layer and overlying layers. Thus, the reference does not exclude the possibility of adding boron to any underlayer except that which is closest to the substrate. Given this teaching, it would have been obvious to one of ordinary skill in the art at the time of invention to add B for the purpose of grain refining to any of the underlayers taught by Wong except for the underlayer closest to the substrate.

Applicant further argues that the combination of Kanbe and Wong does not teach or suggest making the uppermost Cr underlayer boron-free. The examiner agrees. However, the feature is not required by the claims now rejected in view of Wong and Kanbe. As noted above, claims 26 and 28 are limited to this embodiment. However, there is still a question of adequate written description/new matter relating to these claims.

The declaration filed 3/6/06 has been fully considered but does not overcome the 35 USC 103 rejection in view of Wong and Kanbe. Applicant's data is not commensurate in scope with

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the claims. The example referenced in Application Table V has a first underlayer formed from Cr, a second underlayer formed from CrMoB and a CrMo third underlayer. In this example, and in each of the other inventive examples shown in Table IV of the specification, the first and third bcc underlayers are Cr alloys. The examiner notes that claims 1 is not limited to Cr bcc alloys. The inventive examples also require that the first and third underlayers lack B. Again, the claims are not limited in this manner. In addition, all of the examples use a CrMo alloy for the third underlayer. The claims do not require a CrMo third underlayer. As such, the data in the specification does not establish unexpected results associated with the invention that is claimed.

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.



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10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Holly Rickman whose telephone number is (571) 272-1514. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "Holly Rickman", with a stylized, cursive script.

Holly Rickman  
Primary Examiner  
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